## WHAT IS CLAIMED IS:

1. A method for supporting error cause of network management system configured by a Simple Network Management Protocol manager and a Simple Network Management Protocol agent, the method comprising the steps of:

selecting a standard error cause management interface to be used, when an error not defined by Simple Network Management Protocol error cause occurs;

numbering an error cause defined by the selected interface;

storing the numbered error cause in a database of the Simple Network Management Protocol manager database and a database of the Simple Network Management Protocol agent, respectively; and

when standard error cause is databased, exchanging a message between the Simple Network Management Protocol manager and the Simple Network Management Protocol agent, and conducting a network management operation.

2. The method according to claim 1, wherein Transaction Language 1 is used for the standard error cause interface selected.

3. The method according to claim 1, wherein error causes are numbered by categorizing the kinds of error and sub-categorizing already categorized objects additionally, and error objects created when a new error occurs are newly added to corresponding categories.

1    4. The method according to claim 1, wherein the kinds of error causes are numbered at 200

2    intervals.

1    5. The method according to claim 3, wherein the kinds of error causes are numbered at 200

2    intervals.

1    6. The method according to claim 1, wherein the standard error cause stored in the databases

2    is interpreted based on an error status corresponding to a number given by an error analysis

3    application that is installed in the Simple Network Management Protocol agent and the Simple

4    Network Management Protocol manager.

1    7. The method according to claim 1, wherein the standard error cause stored in the databases

2    is represented by a number in an Err-Status field of Simple Network Management Protocol (SNMP)

3    Protocol Data Unit, in accordance with the kind of an error.

1    8. The method according to claim 6, wherein the standard error cause stored in the databases

2    is represented by a number in an Err-Status field of Simple Network Management Protocol (SNMP)

3    Protocol Data Unit, in accordance with the kind of an error.

1    9. The method according to claim 1, wherein the step for exchanging the message between

2   the Simple Network Management Protocol manager and the Simple Network Management Protocol

3   agent and conducting the network management operation comprises sub-steps of:

4       receiving, at the Simple Network Management Protocol agent, a Simple Network

5   Management Protocol message from the Simple Network Management Protocol manager under

6   Get/SetRequest command;

7       comparing and deciding, at the Simple Network Management Protocol agent, whether a

8   normal operation on the Simple Network Management Protocol message is possible by analyzing

9   the received Simple Network Management Protocol message;

10      when the normal operation can be performed, executing, at the Simple Network Management

11  Protocol agent, an internal command, and transmitting a response message thereof to the Simple

12  Network Management Protocol manager;

13      when the Simple Network Management Protocol message is abnormal, comparing and

14  deciding, at the Simple Network Management Protocol agent, whether the Simple Network

15  Management Protocol message can be represented by a Simple Network Management Protocol

16  standard error cause;

17      when the Simple Network Management Protocol message can be represented by the Simple

18  Network Management Protocol standard error cause, transmitting, at the Simple Network

19  Management Protocol agent, the Simple Network Management Protocol manager a response

20  message defined by the Simple Network Management Protocol standard error cause; and

21      when the Simple Network Management Protocol message cannot be represented by the

22  Simple Network Management Protocol standard error cause, transmitting, at the Simple Network

23 Management Protocol agent, the Simple Network Management Protocol manager a response

24 message based on a different error cause.

1       10. An apparatus for supporting error cause of network management system configured of

2 a Simple Network Management Protocol manager and a Simple Network Management Protocol

3 agent, the apparatus comprising:

4       a Simple Network Management Protocol manager mounted with a database for providing

5 Simple Network Management Protocol standard error causes and a database for providing extended

6 standard error causes besides the Simple Network Management Protocol standard error causes by

7 using a different protocol, and an error analysis application for analyzing an extended standard error

8 cause; and

9       a Simple Network Management Protocol agent mounted with a database for providing

10 Simple Network Management Protocol standard error causes and a database for providing extended

11 standard error causes besides the Simple Network Management Protocol standard error causes by

12 using a different protocol, and an error search application for searching an error cause number in case

13 an error cause corresponding to a present error status is found in the extended standard error causes,

14 and recording the error cause number in an Err-Status field of a Simple Network Management

15 Protocol (SNMP) Protocol Data Unit.

1       11. A computer-readable medium having computer-executable instructions for performing

2 a method, comprising:

3    selecting a standard error cause management interface to be used, when an error not defined ·

4    by Simple Network Management Protocol error cause occurs;

5    numbering an error cause defined by the selected interface;

6    storing the numbered error cause in a database of a Simple Network Management Protocol

7    manager database and a database of a Simple Network Management Protocol agent, respectively;

8    and

9    when standard error cause is databased, exchanging a message between the Simple Network

10   Management Protocol manager and the Simple Network Management Protocol agent, and

11   conducting a network management operation.


1    12. The computer-readable medium having computer-executable instructions for performing

2    a method according to claim 11, wherein Transaction Language 1 is used for the standard error cause

3    interface selected.


1    13. The computer-readable medium having computer-executable instructions for performing .

2    a method according to claim 11, wherein error causes are numbered by categorizing the kinds of

3    error and sub-categorizing already categorized objects additionally, and error objects created when

4    a new error occurs are newly added to corresponding categories.


1    14. The computer-readable medium having computer-executable instructions for performing ·

2    a method according to claim 11, wherein the kinds of error causes are numbered at 200 intervals.

**Page 21 of 28**

1    15. The computer-readable medium having computer-executable instructions for performing

2    a method according to claim 11, wherein the standard error cause stored in the databases is

3    interpreted based on an error status corresponding to a number given by an error analysis application

4    that is installed in the Simple Network Management Protocol agent and the Simple Network

5    Management Protocol manager.

1    16. The computer-readable medium having computer-executable instructions for performing

2    a method according to claim 15, wherein the standard error cause stored in the databases is

3    represented by a number in an error status field of Simple Network Management Protocol (SNMP)

4    Protocol Data Unit, in accordance with the kind of an error.

1    17. The computer-readable medium having computer-executable instructions for performing

2    a method according to claim 11, wherein the step for exchanging the message between the Simple

3    Network Management Protocol manager and the Simple Network Management Protocol agent and

4    conducting the network management operation comprises sub-steps of:

5    receiving, at the Simple Network Management Protocol agent, a Simple Network

6    Management Protocol message from the Simple Network Management Protocol manager under

7    Get/SetRequest command;

8    comparing and deciding, at the Simple Network Management Protocol agent, whether a

9    normal operation on the Simple Network Management Protocol message is possible by analyzing

10 the received Simple Network Management Protocol message;

11 when the normal operation can be performed, executing, at the Simple Network Management

12 Protocol agent, an internal command, and transmitting a response message thereof to the Simple

13 Network Management Protocol manager;

14 when the Simple Network Management Protocol message is abnormal, comparing and

15 deciding, at the Simple Network Management Protocol agent, whether the Simple Network

16 Management Protocol message can be represented by a Simple Network Management Protocol ·

17 standard error cause;

18 when the Simple Network Management Protocol message can be represented by the Simple

19 Network Management Protocol standard error cause, transmitting, at the Simple Network

20 Management Protocol agent, the Simple Network Management Protocol manager a response

21 message defined by the Simple Network Management Protocol standard error cause; and

22 when the Simple Network Management Protocol message cannot be represented by the

23 Simple Network Management Protocol standard error cause, transmitting, at the Simple Network

24 Management Protocol agent, the Simple Network Management Protocol manager a response

25 message based on a different error cause.

1 18. A computer-readable medium having stored thereon a data structure comprising:

2 a first field containing data representing selecting a standard error cause management

3 interface to be used, when an error not defined by Simple Network Management Protocol error cause

4 occurs;

5      a second field containing data representing numbering an error cause defined by the selected

6      interface;

7      a third field containing data representing storing the numbered error cause in a database of

8      the Simple Network Management Protocol manager database and a database of the Simple Network

9      Management Protocol agent, respectively; and

10      a fourth field containing data representing, when standard error cause is databased,

11      exchanging a message between the Simple Network Management Protocol manager and the Simple

12      Network Management Protocol agent, and conducting a network management operation, Transaction

13      Language 1 is used for the standard error cause interface selected, the error causes are numbered by

14      categorizing the kinds of error and sub-categorizing already categorized objects additionally, and

15      error objects created when a new error occurs are newly added to corresponding categories, the kinds

16      of error causes are numbered at 200 intervals, the standard error cause stored in the databases is

17      interpreted based on an error status corresponding to a number given by an error analysis application

18      that is installed in the Simple Network Management Protocol agent and the Simple Network

19      Management Protocol manager, the standard error cause stored in the databases is represented by a

20      number in an error status field of Simple Network Management Protocol (SNMP) Protocol Data

21      Unit, in accordance with the kind of an error.

1      19. The computer-readable medium having stored thereon a data structure according to claim

2      18, with the fourth field further comprising of:

3      a first sub-field containing data representing receiving, at the Simple Network Management

4     Protocol agent, a Simple Network Management Protocol message from the Simple Network

5     Management Protocol manager under Get/SetRequest command;

6     a second sub-field containing data representing comparing and deciding, at the Simple

7     Network Management Protocol agent, whether a normal operation on the Simple Network

8     Management Protocol message is possible by analyzing the received Simple Network Management

9     Protocol message;

10     a third sub-field field containing data representing, when the normal operation can be

11     performed, executing, at the Simple Network Management Protocol agent, an internal command, and

12     transmitting a response message thereof to the Simple Network Management Protocol manager;

13     a fourth sub-field containing data representing, when the Simple Network Management

14     Protocol message is abnormal, comparing and deciding, at the Simple Network Management

15     Protocol agent, whether the Simple Network Management Protocol message can be represented by

16     a Simple Network Management Protocol standard error cause;

17     a fifth sub-field containing data representing, when the Simple Network Management

18     Protocol message can be represented by the Simple Network Management Protocol standard error

19     cause, transmitting, at the Simple Network Management Protocol agent, the Simple Network

20     Management Protocol manager a response message defined by the Simple Network Management

21     Protocol standard error cause; and

22     a sixth sub-field containing data representing, when the Simple Network Management

23     Protocol message cannot be represented by the Simple Network Management Protocol standard error

24     cause, transmitting, at the Simple Network Management Protocol agent, the Simple Network

25     Management Protocol manager a response message based on a different error cause.


1     20. A method, comprising of:

2     receiving by an agent of a first protocol, a message of a first protocol from a manager of the .

3     first protocol;

4     determining by the agent, whether the received message can be normally executed;

5     when normal execution of the received message is determined, executing an internal

6     command in the agent and transmitting a response message to the manager;

7     when abnormal execution of the received message is determined, determining by the agent, '

8     whether the abnormal received message can be represented by one of a standard error causes of the

9     first protocol;

10     when it is determined that the received message can be represented by at least one of the

11     standard error causes of the first protocol, transmitting the response message based on the standard

12     error causes to the manager;

13     when it is determined that the received message is impossible to be expressed as at least one

14     of the standard error causes, transmitting by the agent, the response message using different standard

15     error causes.


1     21. The method of claim 20, with the different standard error causes belonging to a second

2     protocol.

1    22. The method of claim 21, with the first protocol being Simple Network Management

2    Protocol.


1    23. The method of claim 22, with the second protocol being Transaction Language 1.